



# SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY

Accredited by National Board of Accreditation,  
AICTE, New Delhi, Accredited by NAAC with "A" Grade - 3.32 CGPA  
Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi,  
Permanent Affiliation to JNTUK, Kakinada  
SEETHARAMPURAM, W.G.DT., NARSAPUR-534280, (Andhra Pradesh)

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING TEACHING PLAN

Course Code	Course Title	Semester	Branch	Contact Period /Week	Academic Year	Semester Commencement Date
23EC4T03	Analog Communications (R-23)	IV	ECE	5	2024-25	16-12-2024
<b>COURSE OUTCOMES</b>						
After completion of the course student are able to						
1	Demonstrate the Modulation and Demodulation techniques of standard AM,DSBSC,SSB and VSB.(K3)					
2	Analyze the concepts of generation and detection of Angle Modulated signals.(K4)					
3	Outline the Radio Transmitters and Radio Receivers with different sections. (K4)					
4	Illustrate the noise performance in Analog Modulation techniques and also the concepts of Pulse Analog Modulation and Demodulation techniques.(K3)					

Unit No	Out Come/Bloom's Level	Topics/Activity	Reference Text book	Contact Periods	Delivery Method	
1	CO1: Demonstrate the Modulation and Demodulation techniques of standard AM,DSBSC,SSB and VSB.(K3)	<b>AMPLITUDE MODULATION (DSB-FC)</b>			Chalk & Talk, PPT, Active Learning & Tutorial.	
		1.1	Introduction to Fourier Transform	T1, T2		1
		1.2	Introduction to communication system	T1, T2		1
		1.3	Need for modulation	T1, T2		1
		1.4	Frequency Division Multiplexing	T1, T2		1
		1.5	Amplitude modulation, time domain and frequency domain description	T1, T2		1
		1.6	Single tone modulation	T1, T2		1
		1.7	Power Relations in AM Wave: Degrees of modulation, Derivation for Modulation Index	T1, T2		1
		1.8	Derivation for Efficiency, Power and Current relationship	T1, T2		1
		1.9	Generation of AM waves: Square law modulator	T1, T2		1
		1.10	Switching modulator	T1, T2		1
		1.11	Detection of AM waves: Square law detector	T1, T2		1
		1.12	Envelope detector	T1, T2		1
		1.13	Class Test			1
<b>TOTAL</b>				<b>13</b>		



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2	CO1: Demonstrate the Modulation and Demodulation techniques of standard AM, DSBSC, SSB and VSB. (K3)	<b>DSB AND SSB MODULATION</b>			Chalk & Talk, PPT, Active Learning & Case Study	
		2.1	Double side band suppressed carrier modulated wave, Bandwidth, Power and Efficiency Calculations.	T1, T2		1
		2.2	Time domain and frequency domain description of DSB-SC wave	T1, T2		1
		2.3	Generation of DSB-SC wave: Balanced modulator	T1, T2		1
		2.4	Balanced Ring modulator	T1, T2		1
		2.5	Coherent detection of DSB-SC modulated wave	T1, T2		1
		2.6	Single side band modulated wave, Bandwidth, Power and Efficiency Calculations.	T1, T2		1
		2.7	Time domain and frequency domain description of SSB wave	T1, T2		1
		2.8	Generation of SSB wave	T1, T2		1
		2.9	Detection of SSB modulated wave	T1, T2		1
		2.10	VSB Modulation and Demodulation	T1, T2		1
		2.11	Comparison of different AM techniques, Applications of different AM systems	T1, T2		1
		2.12	Class Test	T1, T2		1
		<b>TOTAL</b>				<b>12</b>
3	CO2: Analyze the concepts of generation and detection of Angle Modulated signals. (K4)	<b>ANGLE MODULATION</b>			Chalk & Talk, PPT, Active Learning & Tutorial.	
		3.1	Introduction, Basic concepts of Frequency and Phase Modulations	T1, T2		1
		3.2	Single tone frequency modulation	T1, T2		1
		3.3	Spectrum Analysis of sinusoidal FM wave	T1, T2		1
		3.4	Narrow band FM	T1, T2		1
		3.5	Wide band FM, Constant average power	T1, T2		1
		3.6	Transmission bandwidth of FM wave	T1, T2		1
		3.7	Generation of FM wave: Direct FM	T1, T2		1
		3.8	Indirect FM	T1, T2		1
		3.9	Detection of FM Wave: Balanced Frequency discriminator	T1, T2		1
		3.10	Zero crossing detector	T1, T2		1
		3.11	Phase locked loop, Comparison of FM & AM	T1, T2		1
		3.12	Related Problems	T1, T2		1
		3.13	Class Test			1
<b>TOTAL</b>			<b>13</b>			





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4	CO3: Outline the Radio Transmitters and Radio Receivers with different sections. (K4)	<b>RADIO TRANSMITTERS &amp; RECEIVERS</b>			Chalk & Talk, PPT, Active Learning & Project based Learning	
		4.1	Radio Transmitter: Classification of Transmitters	T1, R1		1
		4.2	AM Transmitter, Effect of feedback on AM Transmitter	T1, R1		1
		4.3	FM Transmitter- Variable reactance type	T1, R1		1
		4.4	Phase modulated FM Transmitter, Frequency Stability in FM Transmitter	T1, R1		1
		4.5	Radio Receiver: Classification of Receivers	T1, R1		1
		4.6	Tuned radio frequency receiver	T1, R1		1
		4.7	Super-heterodyne receiver	T1, R1		1
		4.8	RF section and Characteristics, frequency changing and tracking	T1, R1		1
		4.9	IF section	T1, R1		1
		4.10	AGC: Simple and Delayed	T1, R1		1
		4.11	FM Receiver	T1, R1		1
		4.12	Amplitude Limiter	T1, R1		1
		4.13	Comparisons between FM and AM Receiver	T1, R1		1
		4.14	Class Test			1
			<b>TOTAL</b>	<b>14</b>		
5	CO4: Illustrate the noise performance in Analog Modulation techniques and also the concepts of Pulse Analog Modulation and Demodulation techniques. (K3)	<b>NOISE &amp; PULSE ANALOG MODULATION</b>			Chalk & Talk, PPT, Active Learning & Tutorial.	
		5.1	Review of noise and noise sources	T1, R1		1
		5.2	Noise figure	T1, R1		1
		5.3	Noise in Analog communication Systems: Noise in DSB Systems	T1, R1		1
		5.4	Noise in SSB Systems	T1, R1		1
		5.5	Noise in AM System and Noise in Angle Modulation Systems	T1, R1		1
		5.6	Threshold effect in Angle Modulation System	T1, R1		1
		5.7	Pre-emphasis & De-emphasis	T1, R1		1
		5.8	Types of pulse modulation	T1, R1		1
		5.9	Generation & demodulation of PAM(Single polarity, double polarity)	T1, R1		1
		5.10	Generation and demodulation of PWM	T1, R1		1
		5.11	Generation and demodulation of PPM	T1, R1		1
		5.10	Time Division Multiplexing	T1, R1		1
		5.11	TDM Vs FDM	T1, R1		1
	5.12	Class Test		1		
	Content beyond	Applications of different AM techniques	T1, R1	1		



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Syllabus		TOTAL	13
<b>TOTAL PROPOSED NO. OF CLASSES</b>			65

S.No.	AUTHORS/BOOK TITLE/EDITION(latest)/PUBLISHER/YEAR OF PUBLICATION
<b>Text Books :</b>	
1	Simon Haykin & Michael Moher, Principles of Communication Systems, 5 <sup>th</sup> Ed., Wiley, 2009.
2	H. Taub & D. Schilling, Gautam Sahe, Principles of Communication Systems, 4 <sup>th</sup> Ed., TMH, 2017.
<b>Reference Books:</b>	
1	Sanjay Sharma, Analog Communication Systems, S.K. Kataria & Sons, February 2020.
2	Vasudevan K, Analog Communications Problems and Solutions, Springer, August 2021.
<b>Web Details</b>	
1	<a href="http://nptel.ac.in/courses/117102059/">http://nptel.ac.in/courses/117102059/</a> Prof. Surendra Prasad.
2	<a href="https://ict.iitk.ac.in/wp-content/uploads/EE320A-Principles-Of-Communication-CommunicationSystems-4ed-Haykin.pdf">https://ict.iitk.ac.in/wp-content/uploads/EE320A-Principles-Of-Communication-CommunicationSystems-4ed-Haykin.pdf</a> .
3	<a href="https://soaneemrana.org/onewebmedia/ELECTRONICS%20COMMUNICATION%20SYSTEM%20BY%20GEORGE%20KENNEDY.pdf">https://soaneemrana.org/onewebmedia/ELECTRONICS%20COMMUNICATION%20SYSTEM%20BY%20GEORGE%20KENNEDY.pdf</a>

	Name	Signature with date
Faculty-I	Dr. B. S. Rao	
Faculty-II (for common Course)	Dr. B. Sada Siva Rao	
Faculty-III (for common Course)	Mrs.M.Kanaka Durga	
Course Coordinator	Dr. B. S. Rao	
Module Coordinator	Dr. Y.S.V. Raman	
Programme Coordinator	Dr. B. S. Rao	

Principal  
(Dr. A. Gopichand)